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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/612,543	07/07/2000	Makoto Funabashi	1982-0153P	9387

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EXAMINER

CLEVELAND, MICHAEL B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 02/20/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/612,543

Applicant(s)

FUNABASHI, MAKOTO

Examiner

Michael Cleveland

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6 and 18 are unclear because they require that M^I and M^{III} are compounds, but the list of suitable examples are metals, not compounds.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-7, 9-10, 12, 14-15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leblans et al. (U.S. Patent 5,360,578, hereafter '578).

'578 teaches dispersing a calcined (col. 6, line 50-col. 7, line 6) phosphor in a dispersion medium and eliminating grains of a predetermined size by wet classification (e.g., wet sieving) (Abstract, col. 4, line 50-col. 5, line 13, Example 1). The phosphor is then dried (col. 5, lines 34-39) and added to a solution of a binder to form a coating slurry that is applied to the substrate (col. 7, lines 44-53) to form an X-ray panel (i.e., a radiation image conversion panel) (col. 1, lines 9-37). Applicant has defined a "soluble" binder as "having solubility sufficient for preparing the phosphor layer coating liquid which can be applied for forming a phosphor layer"

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(paragraph bridging pages 12 and 13 of the specification). Thus, because the binder of '578 is applied to form a phosphor layer, it meets Applicant's definition of soluble.

As stated above, '578 implies that the particles are classified in a slurry in a first solvent, such as ethanol or methyl ethyl ketone (MEK) (col. 4, lines 13-25, 38-44), dried (col. 5, lines 34-39), and then dispersed in a binder solution of a second solvent, such as 2-methoxy-propanol or ethyl acetate (col. 7, lines 44-47) or methyl ethyl ketone (col. 12, lines 48-57). Where the first and second solvent are different, this has the effect of replacing the original dispersing medium with the solvent in which the binder is substantially soluble (as described above). Thus, it implies that the binder is added to the second solvent and then the phosphor is added to the resulting solution. It does not explicitly teach that the phosphor is dispersed in the solvent, and then the binder is added to the resulting slurry.

Claims 1, 14, 20: However, it has long been settled that the selection of any order of mixing ingredients is *prima facie* obvious. See, for instance, *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) and MPEP 2144.04.II.C.

Also, regarding claims 1 and 20, because '578 teaches that the classification dispersion medium may be methyl ethyl ketone (MEK) (col. 4, lines 13-25 and 38-44) and that the coating slurry solvent may also be MEK (col. 12, lines 48-57), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the binder directly to the classification product in order to have eliminated the unnecessary steps of drying and resupplying solvent.

Claim 2: The solvents may be organic (col. 7, lines 44-47, col. 12, lines 48-57).

Claims 3, 12, 15, and 19: It is desirable to classify the particles in order to remove both large (greater than 40 microns) and small (smaller than 2 microns) particles for the reasons given at col. 3, lines 31-56. The particles may be wet sieved to remove the large particles (col. 4, line 56-col. 5, line 13). The undesired small particles may be removed "before drying", which appears to refer to the wet classification step, by sedimenting the desired particles gravitationally or centrifugally and removing the liquid (i.e., decanting) containing the fine particles continuously (col. 5, lines 34-43).

Claims 5 and 17: The particles are sieved by passing through meshes (col. 4, line 50-col. 5, line 7). Particles over 40 microns in size are undesired (col. 3, lines 30-42). Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a maximum final mesh size of 40 microns, which is less than 50 microns, in order to achieve the desired particle size range.

Claims 6 and 18: The formula for useful phosphors is given at col. 2, lines 6-17. "a" in claim 6 is equivalent to "x" of the formula of '578, and "x" of claim 6 is equivalent to "y" of '578. '578's "x", "M^{II}", and "A" overlaps Applicant's claimed ranges for their equivalents: "a", "M^{II}", and "Ln", respectively. '578's "X" and "y" are identical to Applicant's claimed ranges for their equivalents: "X" and "x", respectively. Applicant's "b", "c", and "d" are 0 in the formula of '578, which is within Applicant's claimed ranges for them.

Claim 7: '578 teaches a ratio of approximately 20 parts phosphor per 100 parts dispersing medium for sieving (e.g., Example 1, Example 10).

Claim 9: The sieving may occur by vibrating the meshes (i.e., screens) (col. 4, lines 50-68).

Claim 10: The particles may be sieved through a plurality of stages having decreasing mesh size (col. 4, line 56-col. 5, line 13).

5. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leblans '578 and further in view of Jamil et al. (U.S. Patent 5,772,916, hereafter '916).

Leblans '578 teaches the limitations of claims 1 and 14, as discussed above. It does not teach that the wet classification a plurality of times. However, '578 does teach a desired size distribution to achieve (col. 4, lines 13-25).

Jamil '916 teaches sieving a phosphors a plurality of times in order to classify the phosphors to a desired size (col. 11, lines 47-62). The implication is that the repeating process aids in the goal of '916 of achieving a narrow phosphor particle size distribution (col. 6, lines 10-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have repeated the sieving process of '578 in order to have achieved better control (i.e., a narrower distribution) of the particle size, as taught by '916.

6. Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leblans '578 and further in view of Ochiai (U.S. Patent 4,501,971, hereafter '971).

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Leblans '578 teaches the limitations of claims 1 and 14, as discussed above.

Claim 8: '578 teaches that the phosphor is dispersed in the medium by stirring vigorously (i.e., turbulently) (col. 11, lines 59-63). However, it is silent as to the stirring mechanism and therefore does not suggest that the stirring occurs with a mixing blade. '971 teaches that phosphor dispersions may be thoroughly mixed by using a propeller mixer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a propeller (i.e., a mixing blade) mixer as the particular mixing mechanism of '578 with a reasonable expectation of success.

Claim 13: '578 is silent as to the relative amounts of the binder and phosphor in the coating solution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have looked to the related art in order to have determined appropriate relative amounts of the components.

Ochiai '971 teaches that the ratio of the binder to phosphor is a result-effective variable and should be about 1:100 to 1:20 (col. 5, lines 37-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the ratio of binder to phosphor within the preferred range with a reasonable expectation of success.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leblans '578 and further in view of Hultsch et al. (U.S. Patent 4,405,454, hereafter '454).

Leblans '578 teaches the limitations of claims 1 and 14, as discussed above. It does not teach that the classification occurs by pressure filtration. However, it indicates that a wide variety of methods are suitable for classifying the particles (col. 4, lines 45-49).

'454 teaches that pressure filtration is another method suitable for classifying particles from dispersions (Abstract, col. 2, lines 56-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pressure filtration as the wet classification method of '578 with the expectation of the similar results.

Response to Arguments

8. Applicant's arguments filed 1/31/2002 have been fully considered but they are not persuasive.

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Applicant argues that the use of M^I and M^{III} is clear. The argument is unconvincing. The Examiner understands that M^I and M^{III} are part of a complex. However, it is still unclear whether M^I and M^{III} are limited to the metals, as suggested by the claim language that they are “chosen from the group consisting of...”, or whether they include compounds (as used, for instance, at 7, and implied by the phrase “excluding Al_2O_3 ”). If the former is intended, the examiner recommends deleting “compound” from line 9 and “compounds, excluding Al_2O_3 ” from line 11. However, this interpretation does not have clear support in the written description. If the latter is intended, the Examiner suggests the phrasing “... M^I indicates at least one compound of an alkali metal selected from the group consisting of Li, Na, K, Rb, and Cs...” and a similar change for the clause involving M^{III} . This interpretation appears to have written support in the specification.

The rejection to claim 20 under 35 USC 112, 2nd paragraph is withdrawn in view of Applicant’s amendment.

Applicant argues that the prior art teaches a drying step that is excluded by the claims. The Examiner disagrees. Drying is not excluded by the claims.

Applicant argues that unexpected results are achieved by avoiding drying of the classified phosphors, as demonstrated by Example 1 and the Comparative Example. Even if the claims were amended to exclude drying, the argument would still not have been convincing because the showing of unexpected results is not commensurate in scope with the claims. The claims are not limited as to the phosphor composition, calcining conditions, solvent concentrations, classified mesh size, and the details of steps 4-7 (pp. 29-32), which were used to obtain the results. Further, they do not contain the solvent substitution step claimed by claim 14. If it is Applicant’s position that Example 2 represents unexpected results for claim 14, the argument is unconvincing for the above reasons and further because the details of the solvent substitution step of Example 2 are not claimed.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703) 308-2331. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-3186 for regular communications and (703) 306-3186 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MBC

MBC

February 15, 2002


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